

This listing of claims replaces all prior listings of the claims in the application.

In the Claims

1-3. (cancelled)

4. (currently amended) The method of Claim 4-10 wherein said trench is formed by anisotropic etching.

5. (currently amended) The method of Claim 4-10 wherein said trench is widened by isotropic etching using a chemistry ~~selected from the group consisting of dry plasma process, wet silicon etch process, and~~including an HNO₃/HF mixture.

6. (currently amended) The method of Claim 4-10 wherein said trench is widened by anisotropic etching using a chemistry selected from the group consisting of wet alkaline chemistry and NH₄OH.

7. (currently amended) The method of Claim 4-10 wherein said trench is deepened by anisotropic etching.

8-9. (canceled)

10. (currently amended) A method of providing a trench capacitor on a semiconductor substrate, comprising:

forming a pad stack on a semiconductor substrate;

forming a hard mask over said pad stack;
patterning said hard mask and said pad stack to form an opening;
vertically etching said substrate ~~in~~ through said opening to form a trench;
horizontally widening sidewalls of said trench ~~to widen an opening of said trench;~~
widening sidewalls of said opening in said pad stack relative to said hard mask such
that said hard mask overhangs said widened sidewalls of said opening in said pad
stack and said widened sidewalls of said trench;
forming a sacrificial collar on said widened sidewalls of said trench;
vertically deepening said trench to create a lower portion extending below said
sacrificial collar; and
forming a capacitor in said lower portion.

11. (original) The method of Claim 10 wherein said pad stack comprises a pad nitride layer overlying a pad stop layer including an oxide.

12. (original) The method of Claim 10 wherein said hard mask comprises an oxide layer selected from the group consisting of a tetraethylorthosilicate (TEOS) deposited oxide layer and a borosilicate glass (BSG) deposited oxide layer.

13. (original) The method of Claim 10 wherein said sacrificial collar comprises a layer of nitride.

14. (currently amended) The method of Claim 13 wherein said sacrificial collar further

comprises a layer of oxide contacting said widened sidewalls of said trench under said layer of nitride.

15. (original) The method of Claim 10 further comprising widening said lower portion by an isotropic etch to achieve a bottle-shaped structure prior to forming said capacitor.

16. (canceled)

17. (currently amended) The method of Claim ~~46~~10 wherein said opening in said pad stack is widened at the same time that said sidewalls of said trench are horizontally widened.

18-20. (canceled)